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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

YU, JAE UN

ART UNIT PAPER NUMBER

2185

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/756,861

Applicant(s)

CHARLES, ANDREW A.

Examiner

Jae U. Yu

Art Unit

2185

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-18 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The examiner acknowledges the applicant's submission of the amendment dated 6/22/2006. At this point claims 1, 4, 10-18 and 20 have been amended and claims 9 and 19 have been canceled. Thus, claims 1-8, 10-18 and 20 are pending in the instant application.

Response to Amendment

In view of the applicant's amendment, the 35 USC 112 rejections to claims 1, 11, 12 and 16-18 are withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 6-11 and 16-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Celi Jr. et al. (US 5,742,797).
2. Independent claims 1 and 11 disclose, "Assigning to each basic unit of user memory [Memory blocks, Figure 4A-4D] a corresponding memory control blocks [Location entries corresponding to memory blocks, Figure 3]"

“Collecting groups of contiguous available control blocks into a plurality of linked lists **[Linked lists of unallocated (“available” from the claim”) control blocks, Figure 3]**, each list for storing a plurality of elements, each element comprising a control block group having an associated minimum size user block” **The element 312 of Figure 3 indicates the size of a corresponding user memory block, wherein the list is organized according to region size from smallest available sized region (“minimum size” from the claim) to largest (Column 7, Lines 63-67).**

“In response to a request for a block of user memory **[A request for a region of memory, Column 7, Lines 60-61]**, searching for a linked list having available control block groups corresponding to user blocks at least as large as the requested size **[Traversing the linked list to locate an unallocated (“available” from the claim) region of sufficient size, Column 7-8, Lines 64-6]**”

“Seizing a block of user memory of the required size **[Allocating a memory region of sufficient size for the memory request, Column 7-8, Lines 60-6]** and making available any surplus block **[“Unallocated” Region 404, Figure 4A]** representing a difference between the requested size of memory **[“Image #1” 402, Figure 4A]** and the size of the seized block of user memory **[Element 211D, Figure 4A]**”

“When deallocating memory **[Deallocation of a memory region, Column 8, Lines 55-54]**, testing whether user blocks of memory **[Element 402, Figure 4C]** immediately

adjacent to the deallocated block **[Element 410, Figure 4C]** are available and if available merging the available blocks to the block being deallocated to create a merged deallocated block” **After the element 402 is deallocated (“available” from the claim), it is merged with the adjacent available block (Element 410) to create a merged deallocated block (Element 412, Figure 4D).**

“Inserting the merged deallocated block into a linked list of available blocks of memory for containing blocks of memory of at least the size of the merged block” **Celi Jr. et al. disclose, “Recompute the available memory region options and reform the linked list” step 604 in Figure 6, wherein the reforming includes combining contiguous unallocated regions into a single unallocated region (Column 9, Lines 39-43) and updating the linked list (Figure 3) for “Image #1” (Element 402, Figure 4C) according to the size of the merged block (Element 412, Figure 4D).**

“Whereby the adding of said surplus block **[Adding the “Unallocated” Region 404 to a Linked List, Figure 3 and 4A]** and the process of creating a merged deallocated block **[Figure 4C and 4D]** helps to avoid fragmentation of memory **[Element 404 of Figure 4A and Element 412 of Figure 4D are defragmented memory blocks]”**

2. **Claims 6 and 16** disclose, “the step of grouping available block groups **[Unallocated Blocks, Figure 3 & 4]** into two-way linked lists **[“Doubly Linked List”, Column 5, Line 42, Figure 3]”**.

3. **Claims 7 and 17** disclose, "ordering said linked list by size" [**Organizing linked list by size, Column 7, Lines 65-66**].

"Finding the linked list having a minimum size at least as large as the requested size [**Traversing the linked list from smallest region to largest region to locate a region of sufficient size based on the memory request, Column 7-8, Lines 60-7**]"

"Substantially searching over linked list for blocks of memory larger than the minimum size linked list until a linked list is found having an available block [**"Unallocated Region", Column 8, Line 4**] of user memory [**Traversing the linked list from smallest region to largest region to locate a region of sufficient size based on the memory request, Column 7-8, Lines 60-7**]"

4. **Claims 8 and 18** disclose, "storing availability bits [**Elements 304, 305, 306 and 307, Figure 3**] for each basic unit of user memory".

"In case said memory control blocks are inadvertently overwritten [**Updating control blocks (Figure 3 & Step 604 of Figure 6) corresponding to the merged block (Element 412, Figure 4D)**], recreating a new set of linked lists [**Element 604, Figure 6**] from data of said availability bits [**Element 602, Figure 6**]"

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6. **Claims 10 and 20** disclose, "wherein addresses of each basic unit of user memory and each control block [**Elements 304, 305, 306 and 307, Figure 3**] are related by a corresponding distance [**Element 312, Figure 3**] from a starting point [**Element 310, Figure 3**] of said user memory and said control block memory [**Element 304, Figure 3**]".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 2-5 and 12-15** are rejected under 35 U.S.C. 103(a) as being obvious over Celi Jr. et al. (US 5,742,797) in view of Calderon et al. (US 2003/0225991 A1).

2. As per **claims 2 and 12**, Celi Jr. et al. disclose the method and apparatus recited in claims 1 and 11.

Celi Jr. et al. do not disclose expressly, "providing a linked list for each size that is a multiple of a basic block size".

Calderon et al. disclose a packet-switching system that comprises “a linked list” of packets varying from 1 to 64 bytes, wherein a basic block size can vary from 1 to 64 bytes in paragraphs 16 and 17.

Celi Jr. et al. and Calderon et al. are analogous art because they are from the same field of endeavor of memory access management.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Celi Jr. et al. by including a packet-switching system that provides a linked list for blocks varying from 1 to 64 bytes as taught by Calderon et al. in paragraphs 16 and 17.

The motivation for doing so would have been the benefits of increasing memory access efficiency as expressly taught by Calderon et al. in paragraph 46.

Therefore, it would have been obvious to combine Calderon et al. with Celi Jr. et al. for the benefit of increasing memory access efficiency to obtain the invention as specified in claims 2 and 12.

3. **Claims 3 and 13** disclose, “said basic block size is 64 bytes [**A 64 bytes packet, Paragraph 16**”.

4. **Claims 4 and 14** disclose, “lists are provided for each user block size [**“a linked list” of packets varying from 1 to 64 bytes, Paragraphs 16 & 17**] that is a multiple of a basic block size [**Basic blocks varying from 1 to 64 bytes, Paragraph 16**] up to

some limit [**“Maximum Packet Size”, Paragraph 16**] and wherein user block sizes above said limit are in multiples of a superblock size, said superblock size being larger than said basic block size [**Any block sizes between 1 byte to 4 megabytes larger than the “basic block size”, Paragraph 16**].

5. **Claims 5 and 15** disclose, “said superblock size is 4K bytes [**Block sizes between 1 byte to 4 megabytes, Paragraph 16**]”.

Arguments Concerning Prior Art Rejections

1st Point of Argument

Regarding claims 1 and 11, the applicant argues that Celi does not teach the limitation, “collecting groups of contiguous available control blocks into a plurality of linked lists, each list for storing a plurality of elements, each element comprising a control block group having an associated minimum size user block”. However, Celi teaches linked lists of contiguous unallocated (“available” from the claim) control blocks in Figure 3 and each “linked list entry” for storing a plurality of elements (Elements 304-307, Figure 3) wherein the “associated minimum size user block” for the “Elements 304-307” is the “Size” 312 (Figure 3) that contains the smallest size since the elements are sorted in increasing memory size order.

2nd Point of Argument

Regarding claims 1 and 11, the applicant argues that Celi does not teach the limitation, "in response to a request for a block of user memory, searching for a linked list having available control block groups corresponding to user blocks at least as large as the requested size". However, Celi teaches a request for a region of memory in column 7, at lines 60-61 and traversing the linked list to locate an unallocated ("available control block group" from the claim) region of sufficient size in column 7-8, at lines 64-6. Further, the applicant states that the claimed invention searches a plurality of linked lists (Page 9, Lines 1-2). However, the corresponding claim limitation on page 8 does not disclose such method.

3rd Point of Argument

Regarding claims 1 and 11, the applicant argues that the control blocks are associated with a common size block of user memory. However, the corresponding claim limitation does not teach about size of memory blocks.

4th Point of Argument

Regarding claims 7 and 12, the applicant argues that Celi does not teach the limitation, "ordering said linked lists by size". However, Celi discloses linked lists (Elements 304-307) ordered by size in Figure 3.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

A. Claims No Longer in the Application

Claims 9 and 19 were cancelled by the amendment dated 6/22/2006.

B. Claims Rejected in the Application

Per the instant office action, claims 1-8, 10-18 and 20 have received a second action on the merits and are subject of a second action final.

C. Direction of All Future Remarks

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jae Un Yu who is normally available from 9:00 A.M. to

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5:30 P.M. Monday thru Friday and can be reached at the following telephone number:
(571) 272-1133.

If attempts to reach the above noted examiner by telephone are unsuccessful, the Examiner's supervisor, Sanjiv Shah, can be reached at the following telephone number: (571) 272-4098.

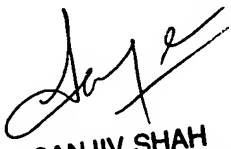
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September 12, 2006

Jae Un Yu

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JY


SANJIV SHAH
PRIMARY EXAMINER